trict. Reference is further made to the late floods. Within the last fortnight a great calamity has befallen us. Inundations to an extent unknown in the colony for a long series of years have inflicted serious though only temporary damage on a large tract of country. The loss of life, so far as I can ascertain, has been but small, considering the suddenness and extent of the floods; but many houses have been swept away, and a large amount of native property destroyed."

It appears that a bridge on the Randy railway, that over the Hanwella road, was broken down by the flood, and at the time the Governor spoke traffic with the Central Province was interrupted. Three persons employed in the department were drowned when the railway bridge was swept away. Science is evidently not likely to suffer in the hands of Mr. Gregory.

OCEAN METEOROLOGICAL OBSERVATIONS

Remarks to accompany the Monthly Charts of Meteorological Observations for No. 3 *Square, extending from the Equator to* 10° *N., and from* 20° *to* 30° *W.* (Printed for private circulation, by authority of the Meteorological Committee of the Board of Trade.)

THIS portion of the Meteorological Committee's work in the discussion of Ocean Meteorology has been printed by the Committee for distribution among meteorologists and others, with the view of eliciting their opinions on the utility of the method adopted, together with any suggestions they may have to offer. The chart issued with the remarks gives the results of the discussion of No. 3 Square of Marsden's numbered squares for the month of January. This square has been selected as the one of greatest importance, and in which the largest number of observations have been collected. It is divided in the chart into 100 squares of 1° each, in which are set down, in a compact form, the results of the discussion as respects wind, variation, atmospheric pressure, air and sea temperature, humidity, the currents and specific gravity of the sea, and, in the margin, weather and cloud.

In attempting to give the results of so many subjects in a small space, and with one printing, not a little has been sacrificed to clearness. The chart has considerable merit as an ingenious and compact tabulation of results; but little praise can be awarded to it as a chart or diagram telling its own story at once clearly and readily to the eye—a characteristic which charts specially addressed to seamen ought to have. Printing in colours would introduce some improvement, but as regards the important subject of the winds more will be required, if the present method of presenting the results be adhered to. By this method the arrow representing the largest number of wind observations extends to the centre of the circle included in each square; and hence the arrows representing the winds of *different* squares cannot be directly compared together. Since such comparisons can only be made by the arrows of each square being drawn to show by their lengths the percentages each wind direction is of the whole number of winds observed in the square, a separate wind chart will be necessary in the text accompanying the charts.

Three small charts are given with the Remarks (p. 43), showing the pressure and temperature of the air and the temperature of the sea. These have been constructed by grouping the 100 squares into twenty-five squares of 2° each. As respects pressure, the isobarics are drawn for every two-hundredths of an inch of mean pressure. The *outré* forms of the isobarics are such as to suggest the idea that the method of discussing the barometric observations is faulty. An examination shows it to be so on two important points, which will appear from the following extract from the chart of the observations of the four contiguous sub-squares (Nos. 59, 58, 49, and 48), of which the mean pressures are stated in inches, the number of observations in each case being printed within brackets:—

6° N.		
	29·882 (3)	29.963 (14)
5° N.		
	29·870 (2)	29·939 (15)
4° N.		

30° W. 29° W. 28° W.

In the small isobaric chart these four results are treated as of equal value, and the average of this 2° square is calculated by taking their simple arithmetical mean; accordingly 29·914 inches is entered as the mean. Now a little reflection shows that the averages 29·882 and 29·870 inches, based respectively on 3 and 2 observations, are very faulty as approximations to the true averages of their squares. In such cases the method of discussion is to deduce the new averages not from the averages of the four sub-squares, but from the whole of the observations added together and divided by 34, the number of the observations. By doing so we obtain in the above case the average 29·940 inches. Similarly we have discussed the whole of the 100 squares, and the result is the disappearance of several of the anomalies in the new isobarics drawn from the twenty-five new averages thus calculated.

But other anomalies remain, which lead to the second point on which the method of discussion is defective. The method is thus described in the Introductory Remarks (page 1):—

> "The various hours at which the observations were taken may not give the mean result for the twenty-four hours; still, as the same hours have been generally extracted, we may confidently hope that the temperatures and pressures obtained from the means of the whole will give very good relative results for comparing the meteorological state of one part of 10° square with that of another. In making the extracts the hour of each observation has been recorded, so that any inquiry depending on the hours might be carried out if thought requisite."

The confident hope here expressed is very remarkable in the face of the averages printed on the chart, of which an example is given above. The truth is, comparableness of the results of the different squares is not to be looked for except in cases where the observations are numerous. Since the daily range of the barometer is large in these regions, averages based only on a few observations—regarding the hours at which they were made we have no information—are worthless in every inquiry in which comparisons require to be made. Now looking at the squares, we find from the chart that there

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are fifty-one out of the 100 whose pressure averages are based on fewer than twenty observations; thirty-five averages on fewer than fifteen observations; and sixteen averages, or a sixth of the whole, based on fewer than ten observations. Hence the incomparableness of the results of the 1° and 2° squares, *inter se*, and the general unsatisfactoriness of this part of the work. The same objections apply with perhaps equal force to the discussions of the temperatures of the air and those of the sea.

Range corrections for pressure and temperature over the region under discussion are not yet accurately enough known to justify the committee in "correcting" the results on the large chart by hypothetical corrections. Since, however, it is most desirable to attempt a discussion of the results of the squares, so as to arrive at a knowledge of the approximate distribution of the temperature and pressure of this important part of the ocean; and since such a discussion necessarily calls for a preliminary preparation of the results by the application of such approximate corrections for range as we are in possession of, and which cannot be far from the mark; the Meteorological Committee will require to give *the mean day of the month and the mean hour of the day for each of the averages of the squares.* Indeed, without this additional information the results can scarcely be said to possess any strict scientific value.

With this additional information, some highly interesting questions suggested by the chart could be examined, such as the relations of the pressure, air and sea temperature, and humidity in these 1° squares, viz., Nos. 93, 94; 82, 83; and 72, 73, to the squares contiguous to them. But, so far as the chart informs us, the interesting anomalies here indicated may be due to no more than differences in the mean hour of the observations of each square.

We should also wish to see added, as respects each square, an enumeration of all the unusually low and unusually high observations of pressure and temperature which have been made use of in calculating the averages. This will be the more desirable as the discussion proceeds into other parts of the ocean where barometric and thermometric disturbances are of more frequent occurrence, and where the number of observations is fewer than in this No. 3 square "in which the largest number of observations have been collected."

The vital importance of a knowledge of pressure and temperature range in discussing Ocean Meteorology it is unnecessary to insist upon. For this information we must look, perhaps we may say exclusively, to the Boards of Admiralty of this and other countries, it being only through such bodies that systems of hourly or two-hourly observations at sea can be organised and carried out. May we hope that, among the contributions to science which Prof. Wyville Thomson will bring back from his circumnavigation cruise, one will be data for the determination of barometric and thermometric constants which are so indispensable in the reduction of Ocean Meteorological statistics.

In offering these suggestions to the consideration of the Meteorological Committee, we desire to express our deep sense of the importance of this department of their work, and our hearty thanks for the care they are taking to ensure its efficient execution; and we may confidently hope that the method of discussion finally resolved on will lead to results which, taken in connection with similar discussions undertaken by the Dutch, French, German, Norwegian, and other Governments, will place Ocean Meteorology on a broad and sound basis, and thus lead towards the solution of many questions vital, not merely to navigation, but to a right understanding of the more complex problems of the Land Meteorology of the Globe.

GIEBEL'S THESAURUS ORNITHOLOGIÆ

Thesaurus Ornithologiæ. Repertorium der gessammten ornithologischen Literatur und Nomenclatur sammtlicher Gattungen und Arten der Vögel nebst Synonymie und geographischer Verbreitung. Von Dr. C. G. Giebel. Erster und Zweiter Halbbänder. (Leipzig: Brockhaus, 1872.)

IN this work, we regret to say, the performance does not equal the promise. Nothing would be more acceptable to the many students of the class of Birds than such a "Repertorium" as Prof. Giebel's title seems to indicate. Nor is there anything objectionable in the manner in which he proposes to treat his somewhat extensive subject, although other plans would be equally or more convenient. But when we come to look into details and to consider the mode of execution, we must condemn the work as almost useless to ornithologists from its errors and imperfections.

The first portion of the "Repertorium" professes to give us a complete list of the literature relating to ornithology, arranged under certain heads. But numerous volumes and papers of the greatest importance to the ornithologist are either altogether omitted, or are inserted under wrong headings. For example, Cabanis and Heine's "Museum Heineanum" is not alluded to at all, nor can we find Finsch and Hartlaub's "Ornithologie Ost-Afrika's," Fraser's "Zoologia Typica," or Gilliss's "Astronomical Expedition" (Birds by Cassin) entered under the proper heads. These are all works which a working ornithologist would have occasion to consult frequently. A long list might easily be made of similar omissions. In the section of this part of the "Repertorium" which treats of local faunas, many ridiculous blunders are made. Memoirs referring to Africa and South America are entered under Asia, and a number of South American papers are attributed either to *America Septentrionalis*, or *America Centralis.*

In the second part of the "Repertorium," called "Nomenclator Ornithologicus," it is pretended to give a list of all the described genera and species of the class of birds in alphabetical order, with references to authorities, synonymy, and other points. Nothing could be of greater use to the ornithologist, if such a task were well or even fairly well performed. But this, we regret to say, is not the case, as anyone with previous knowledge of the subject will very quickly discover, on turning over Prof. Giebel's pages. It is, in fact, quite evident that the "Repertorium" is a mere compilation, upon which, no doubt, long and weary labour has been bestowed, but which, as is often the case with compilations, will be of very little value to the student, owing to the compiler having had insufficient previous knowledge of his subject.

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